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ASME B40.1 Accuracy for Pressure Indicating Dial Type, Elastic Element Gauges

The following tables define the ASME B40.1 accuracy grades. Accuracy of a pressure gauge may be expressed as percent of span or percent of indicated reading. Percent of span is the most common method. Percent of indicated reading is usually limited to precision test gauges and unless specifically spelled out, it may be assumed that an accuracy of $\pm\frac{1}{2}\%$ means $\pm\frac{1}{4}\%$ of span.

Grade	Permissible Error % of Span (Excluding Friction)			Minimum Recommended Number of Test Points (Note)
	Lower 25%	Middle 50%	Upper 25%	
4A	$\longleftrightarrow \pm 0.1 \longleftrightarrow$			10
3A	$\longleftrightarrow \pm 0.25 \longleftrightarrow$			5
2A	$\longleftrightarrow \pm 0.5 \longleftrightarrow$			5
1A	$\longleftrightarrow \pm 1.0 \longleftrightarrow$			5
A	± 2	± 1	± 2	5
B	± 3	± 2	± 3	3

Note: The test points shall be distributed over the dial range and shall include points within 10% of the ends of the dial range.

ASME B40.7 Accuracy for Pressure Indicating Digital Gauges

Grade	Permissible Error		Recommended Number of Test Points (Note)
5A	$\pm 0.05\%$	of span	15
4A	$\pm 0.1\%$	of span	10
3A	$\pm 0.25\%$	of span	5
2A	$\pm 0.5\%$	of span	5
A	$\pm 1.0\%$	of span	5
B	$\pm 2.0\%$	of span	3
5AR	$\pm 0.05\%$	of reading	15
4AR	$\pm 0.1\%$	of reading	10
3AR	$\pm 0.25\%$	of reading	5
2AR	$\pm 0.5\%$	of reading	5
AR	$\pm 1.0\%$	of reading	5
BR	$\pm 2.0\%$	of reading	3

Note: The test points shall be distributed over the dial range and shall include points within 10% of the ends of the dial range.

The information above is derived from B40.1 & B40.7 contained in ASME B40.100. Printed copies are available from ASME, Three Park Ave, New York NY 10016. You can visit their website at www.asme.org.

Grade 4A gauges offer the highest accuracy and are calibrated to $\pm 0.1\%$ of span over the entire range of the gauge. The gauges are called laboratory precision test gauges and are generally 8½", 12" or 16" dials. These high-accuracy test gauges may be temperature compensated. They must be handled carefully in order to retain accuracy.



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Wika 21X.54

DIAL SIZE	2 1/2" (63mm) 4" (100mm)
ACCURACY	2-1-2% - Grade A 1% of span - Grade 1A
CASE MATERIAL	Stainless Steel
WETTED MATERIAL	Copper Alloy
CONNECTION	1/4" NPT Lower 1/4" NPT Back 1/2" NPT Lower 1/2" NPT Back

Grade 3A gauges are calibrated to an accuracy of $\pm 0.25\%$ of span over the entire range of the gauge. The gauges are called test gauges and are generally $4\frac{1}{2}$ ", 6" or $8\frac{1}{2}$ " dials. The test gauges are generally not temperature compensated.

Grade 2A gauges are calibrated to an accuracy of $\pm 0.5\%$ of span over the entire range of the gauge. These gauges are generally used by the petrochemical industry for process pressure measurement. They are often referred to as process gauges and are usually supplied as $4\frac{1}{2}$ " and 6" cases and are not temperature compensated.

Grade 1A gauges are calibrated to an accuracy of $\pm 1\%$ over the entire range of the gauge. These gauges are high-quality industrial gauges and are supplied in $2\frac{1}{2}$ ", $3\frac{1}{2}$ ", $4\frac{1}{2}$ ", 6" and $8\frac{1}{2}$ " sizes.

Grade A gauges are calibrated to an accuracy of $\pm 1\%$ of span over the middle half of the scale and $\pm 2\%$ of span over the first and last quarters of the scale. These gauges are often referred to as industrial gauges and usually supplied in $2\frac{1}{2}$ ", $3\frac{1}{2}$ ", $4\frac{1}{2}$ " and 6" case sizes.

Grade B gauges are calibrated to an accuracy of $\pm 2\%$ of span over the middle half of the scale and $\pm 3\%$ of span over the first and last quarters of the scale. This accuracy of gauge represents the majority of manufactured and used for pressure measurement on water pumps, swimming pool filters, air compressors, filler regulations, etc. These gauges are often referred to as commercial or utility gauges and are supplied in $1\frac{1}{2}$ ", 2", $2\frac{1}{2}$ ", $3\frac{1}{2}$ " and $4\frac{1}{2}$ " case sizes.

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